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MINERAL INFORMATION SERVICE

VOL. 5 September 1, 1952 No. 9

MINERAL INFORMATION SERVICE is a monthly news release concerning the mineral resources and industry of CALIFORNIA, designed to inform the public of the discoveries, operations, markets, statistics, and new publications. It is distributed without cost upon request.

ARVIN-TEHACHAPI EARTHQUAKE

Once again, on the morning of July 21, 1952, a moderately severe earthquake demonstrated that Californians live in a seismically active belt of geologically young, developing mountain ranges and valleys. Principal damage to buildings, pipelines, irrigation systems, and to the large Paloma petroleum refinery west of Bakersfield, centered around Arvin, a few miles south of Bakersfield; the towns of Arvin and Tehachapi in Kern County suffered most.

Along with the rest of the margin of the Pacific Ocean, California has had a history of hundreds of more or less damaging shocks in the past century and a half. Four great earthquakes, (San Juan Capistrano, Fort Tejon, Owens Valley, and San Francisco), with intensities considerably greater than this last, stand out above the rest. The San Juan Capistrano earthquake of 1812 is the earliest of the major earthquakes substantiated by good written records. Many lives were lost in the destruction of the Capistrano Mission and Santa Ynez Mission, 170 miles apart. Geologists and seismologists are inclined to believe movement along a submarine fault off the Santa Barbara coast was responsible.

The San Andreas rift, California's greatest active fault, clearly traceable for over 650 miles from Pt. Arena to the Salton Sea, has undergone repeated movement, mostly of the horizontal right-lateral type (east block moving south), and has been responsible for many earthquakes. In 1857 such an abrupt movement took place along the rift for 225 miles between Cholame Valley and San Bernardino, resulting in the Fort Tejon earthquake felt from Fort Yuma to Sacramento.

The greatest ever recorded in California was the Owens Valley earthquake of 1872, which resulted from movement along one of the major faults of the Sierra Nevada fault zone at the steep eastern base of the Sierra. Surface displacement was noted from Haiwee to Bishop, reaching a miximum of 20 feet horizontally and 23 feet vertically near the town of Lone Pine. This scarp is still visible north of Lone Pine.

The San Francisco earthquake of 1906 resulted from chiefly horizontal displacement along the San Andreas fault; the east block moved relatively south a maximum of 21 feet just south of Tomales Bay. Surface cracks were reported along the rift zone from upper Mattole in Humboldt County to San Juan Bautista in San Benito County.

Other less damaging shocks include the Hayward earthquakes of 1836 and 1868 (movement on the Hayward fault similar in nature to the San Andreas fault); major earthquakes centering along the San Andreas fault (San Francisco-Santa Clara, 1838 and 1865, and Imperial Valley in 1940); and San Jacinto in 1899 and 1918 (movement on San Jacinto fault, closely related to San Andreas fault). Several major earthquakes have been attributed to fault displacement offshore on the rugged continental shelf. These include Cape Mendocino (1922), Santa Barbara (1925), Point Arguello (1927), and Long Beach (1933), as well as the San Juan Capistrano earthquake. The Mendocino escarpment, Santa Barbara Channel, and San Pedro Channel seem to be particularly active seismically.

The Arvin-Tehachapi earthquake of July 21, 1952, was again, like all of the really great earthquakes recorded in California, the immediate result of abrupt displacement along a fault; in this case, the White Wolf fault (sometimes called "Bear Mountain fault") trending approximately N. 50° E. from Wheeler Ridge to Caliente. This fault was named by H.W. Hoots in 1930 and appears on a number of geologic maps, including those by California Division of Mines, Dibblee, Lawson, Reed and Hollister, and Wood. The late Professor Andrew C. Lawson was probably the first to recognize this fault; he published a map showing it, in his paper on the "Geomorphogeny of the Tehachapi Valley System", in 1906. Thus, geologists working in the area have long recognized the steep landslide-marked northwest face of Bear Mountain as a fault scarp. Geologic recency of movements on the White Wolf fault are attested by the abrupt little-eroded escarpment, and the numer-